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Employing a Zyvex S100 Nanomanipulator Within a Complex Plasma BRANDON HARRIS, LORIN MATTHEWS, TRUELL HYDE, CASPER - Baylor University — Particles within a Coulomb crystal formed in the plasma sheath above the powered lower electrode in a GEC reference cell are examined using a Zyvex S100 nanomanipulator. Using the S100, a powered probe is positioned vertically within the cell transverse to the center of the crystal. It will be shown that as the probe is lowered toward the horizontal dust lattice plane, a circular dust void is formed. When the probe potential is driven employing a sinusoidal oscillation, an out of phase oscillation develops with dust near the probe moving in a primarily vertical counter clockwise loop and dust far from the probe moving in a primarily vertical clockwise loop. At the critical point between these two extremes, the dust particles oscillate along a linear vertical path due to the force balance between probe attraction, dust repulsion, and the confinement provided by the electrode geometry. A model describing the probe's interaction with the complex plasma system will be discussed and basic plasma parameters within the sheath will be examined.

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